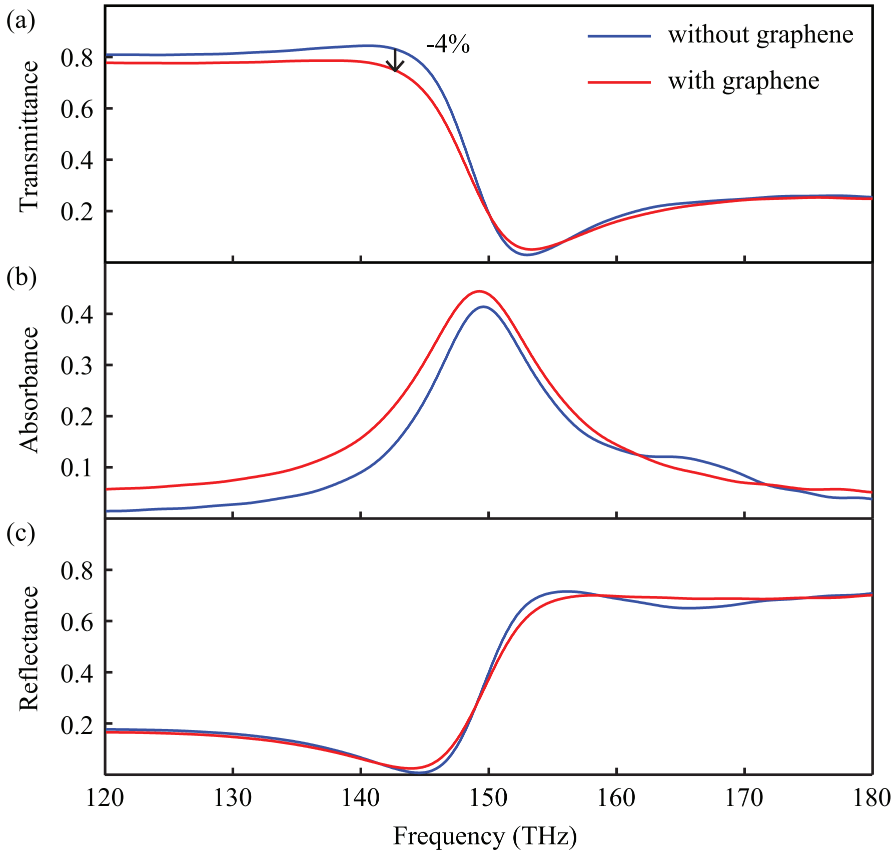

Fig. 6. Comparison between the scattering properties of the wire-pair metamaterial with and without graphene. (a) Transmittance. (b) Absorbance. (c) Reflectance.

resonant electric field is perpendicular to the plane of the graphene sheet. These conclusions may be useful in the design of tunable metamaterials. Graphene can indeed be biased by an electric potential, allowing for electro-optic control over the metamaterial's response with potentially very high modulation rates [7]. This approach will only work for metamaterials of the SRR-type with resonant electric fields predominantly parallel to the graphene flake, as opposed to wire-pair/fishnet metamaterials that cannot interact with graphene because their resonant electric field is predominantly perpendicular to the planar structure.

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